WHAT IS CLAIMED IS:

1. A method of preparing a polymannuronate composition, comprising:

providing alginate;

hydrolyzing the alginate to form a mixture comprising polymannuronate and polyguluronate, wherein the polymannuronate has a molecular weight ranged from about 4,000 to about 500,000; and

isolating the polymannuronate from the mixture.

2. The method of Claim 1, wherein the providing the alginate comprises extracting the alginate from marine algae.

3. The method of Claim 1, wherein the alginate has a molecular weight from about 2,000,000 to about 4,000,000.

4. The method of Claim 1, wherein the hydrolysis is carried out for about 20 minutes to about 3 hours.

5. The method of Claim 1, wherein the hydrolysis is carried out for about 40 minutes to about 2 hours.

6. The method of Claim 1, wherein the hydrolysis is carried out for about 1 hour to about 1.5 hours.

7. The method of Claim 1, wherein the polymannuronate has a molecular weight from about 10,000 to about 100,000.

8. The method of Claim 1, wherein the polymannuronate has a molecular weight from about 25,000 to about 80,000.

9. The method of Claim 1, wherein the polymannuronate has a molecular weight from about 40,000 to about 50,000.

10. The method of Claim 1, wherein the hydrolysis comprises adding one or more organic acids to the alginate and heating the mixture of the alginate and the organic acid.

11. The method of Claim 10, wherein the organic acid is selected from the group consisting of citric acid, malic acid, oxalic acid, lactic acid, succinic acid, tartaric acid and acetic acid.

12. The method of Claim 10, wherein the organic acid is acetic acid.

13. The method of Claim 10, wherein the concentration of the organic acid is from about 0.2 M to about 0.6 M.

14. The method of Claim 1, wherein the isolation of polymannuronate comprises adjusting pH of the mixture.

15. The method of Claim 14, wherein the pH of the mixture is adjusted to a range from about 2.5 to about 3.5.

16. The method of Claim 14, wherein the pH of the mixture is adjusted to a range from about 2.8 to about 3.0.

17. The method of Claim 14, wherein the pH adjustment is carried out by adding one or more acids.

~~18. The method of Claim 17, wherein the acid is an organic acid.~~

19. The method of Claim 1, wherein the isolation of polymannuronate comprises forming a precipitate in the mixture and collecting a supernatant, in which the polymannuronate is dissolved.

20. The method of Claim 19, wherein the isolation further comprises precipitating the polymannuronate from the collected supernatant.

21. The method of Claim 1, wherein the isolation of polymannuronate isolates the polymannuronate with a purity from about 70 wt.% to about 98 wt.%.

22. The method of Claim 1, wherein the isolation of polymannuronate isolates the polymannuronate with a purity from about 80 wt.% to about 97 wt.%.

23. The method of Claim 1, wherein the isolation of polymannuronate isolates the polymannuronate with a purity from about 90 wt.% to about 95 wt.%.

~~24. A polymannuronate composition prepared by the method of Claim 1.~~

25. The polymannuronate composition of Claim 24, wherein the composition comprising polymannuronate with a molecular weight ranged from about 4,000 to about 500,000.

26. The polymannuronate composition of Claim 25, wherein the polymannuronate in the composition has a concentration from about 70 wt.% to about 98 wt.%.

27. The polymannuronate composition of Claim 24, wherein the composition comprising polymannuronate with a molecular weight ranged from about 10,000 to about 100,000.

28. The polymannuronate composition of Claim 24, wherein the composition comprising polymannuronate with a molecular weight ranged from about 25,000 to about 80,000.

29. The polymannuronate composition of Claim 24, wherein the composition comprising polymannuronate with a molecular weight ranged from about 40,000 to about 50,000.

30. The polymannuronate composition of Claim 24, wherein the isolated polymannuronate dissolved in water at a concentration of 2 % (w/v) has a viscosity from about 1.25 to about 15 at 25 °C.

31. The polymannuronate composition of Claim 24, wherein the isolated polymannuronate dissolved in water at a concentration of 2 % (w/v) has a viscosity from about 2 to about 10 at 25 °C.

32. The polymannuronate composition of Claim 24, wherein the isolated polymannuronate dissolved in water at a concentration of 2 % (w/v) has a viscosity from about 3 to about 7 at 25 °C.

33. Isolated polymannuronate having a molecular weight ranged from about 4,000 to about 500,000 with a purity from about 70 wt.% to about 98 wt.%.

34. The isolated polymannuronate of Claim 33, wherein the polymannuronate has a molecular weight from about 10,000 to about 100,000.

35. The isolated polymannuronate of Claim 33, wherein the polymannuronate has a molecular weight from about 25,000 to about 80,000.

36. The isolated polymannuronate of Claim 33, wherein the polymannuronate has a molecular weight from about 40,000 to about 50,000.

37. The isolated polymannuronate of Claim 33, wherein the purity is from about 80 wt.% to about 97 wt.%.

38. The isolated polymannuronate of Claim 33, wherein wherein the isolated polymannuronate dissolved in water at a concentration of 2 % (w/v) has a viscosity from about 1.25 to about 15 at 25 °C.

39. The isolated polymannuronate of Claim 33, wherein wherein the isolated polymannuronate dissolved in water at a concentration of 2 % (w/v) has a viscosity from about 2 to about 10 at 25 °C.

40. The isolated polymannuronate of Claim 33, wherein the isolated polymannuronate dissolved in water at a concentration of 2 % (w/v) has a viscosity from about 3 to about 7 at 25 °C.

41. A nutritional composition comprising a foodstuff and polymannuronate having a molecular weight from about 4,000 to about 500,000, wherein in case the nutritional composition comprises polyguluronate, the polyguluronate is in an amount less than about 30 wt.% of the total weight of the polymannuronate and polyguluronate.

42. The nutritional composition of Claim 41, wherein the polyguluronate is in an amount less than about 15 wt.% of the total weight of the polymannuronate and polyguluronate.

43. The nutritional composition of Claim 41, wherein the polyguluronate is in an amount less than about 10 wt.% of the total weight of the polymannuronate and polyguluronate.

44. The nutritional composition of Claim 41, wherein the polymannuronate is in an amount from about 0.00001 wt.% to about 50 wt.%.

45. The nutritional composition of Claim 41, wherein the polymannuronate is in an amount from about 0.0001 wt.% to about 15 wt.%.

46. The nutritional composition of Claim 41, wherein the foodstuff is in a liquid or solid form.

47. The nutritional composition of Claim 41, wherein the foodstuff is selected from the group consisting of beverages, margarine, hams and noodles.

48. The nutritional composition of Claim 41, wherein the polymannuronate has a molecular weight from about 10,000 to about 100,000.

49. The nutritional composition of Claim 41, wherein the polymannuronate has a molecular weight from about 25,000 to about 80,000.

50. The nutritional composition of Claim 41, wherein the polymannuronate has a molecular weight from about 40,000 to about 50,000.

51. A pharmaceutical composition comprising polymannuronate and a pharmaceutical carrier, wherein the polymannuronate has a molecular weight from about 4,000 to about 500,000.

52. The pharmaceutical composition of Claim 51, wherein in case the pharmaceutical composition comprises polyguluronate, the polyguluronate is in an

amount less than about 30 wt.% of the total weight of the polymannuronate and polyguluronate.

53. The pharmaceutical composition of Claim 51, wherein the polymannuronate has a molecular weight ranged from about 10,000 to about 100,000.

54. The pharmaceutical composition of Claim 51, wherein the polymannuronate has a molecular weight ranged from about 25,000 to about 80,000.

55. The pharmaceutical composition of Claim 51, wherein the polymannuronate has a molecular weight ranged from about 40,000 to about 50,000.

56. A method of treatment selected from the group consisting of controlling cholesterol level in blood, controlling serum lipids, preventing hyperlipidemia, preventing obesity, preventing diabetes, and enhancing functions of liver, the method comprising administering a composition comprising a pharmaceutically acceptable carrier and polymannuronate having a molecular weight from about 4,000 to about 500,000 to a patient in need of such treatment.

57. The method of Claim 56, wherein the polymannuronate has a molecular weight from about 10,000 to about 100,000.

58. The method of Claim 56, wherein the polymannuronate has a molecular weight from about 25,000 to about 80,000.

59. The method of Claim 56, wherein the polymannuronate has a molecular weight from about 40,000 to about 50,000.

60. The method of Claim 56, wherein in case the composition comprises polyguluronate, the polyguluronate is in an amount less than 30 wt.% of the total weight of the polymannuronate and polyguluronate.

61. The method of expelling heavy metals from a body, comprising administering a composition comprising a pharmaceutically effective amount of polymannuronate and a pharmaceutically acceptable carrier, wherein the polymannuronate has a molecular weight from about 4,000 to about 500,000.